CLAIMS

1. An apparatus for processing a screw rotor, comprising a bed; a C-axis shaft supporter disposed on the bed; a C-axis shaft held by the C-axis shaft supporter, for rotating a cylindrical workpiece; a column disposed on the bed; a blade holder rotatably held by the column; and a tool attached to the blade holder,

wherein the apparatus further comprises a special shaft and an workpiece-attaching member, the special shaft being connected to the C-axis shaft and rotating in synchronism with the C-axis shaft, the workpiece-attaching member being connected to the special shaft and rotating in synchronism with the special shaft.

2. The apparatus according to claim 1, further comprising a shake stopper disposed on the bed, the shake stopper supporting the special shaft.

3. The apparatus according to claim 1 or claim 2, further comprising an automatic measuring system for measuring the width of a processed screw groove.

4. A method for processing a screw rotor comprising a step of rotating a blade holder while shifting the blade holder in X-axis, Y-axis, and Z-axis directions to form a screw groove on the outer surface of a rotating cylindrical workpiece with

a tool, using a processing apparatus comprising a bed; a C-axis shaft supporter disposed on the bed; a C-axis shaft held by the C-axis shaft supporter, for rotating the cylindrical workpiece; a column disposed on the bed; the blade holder rotatably held by the column; and the tool attached to the blade holder.

5. The method according to claim 4, wherein said step to form a screw groove includes a first step of roughly cutting the groove on the outer surface of the workpiece and a second step of shaving the side surfaces and the bottom surface of the groove.

6. The method according to claim 5, wherein the first step comprises a sub-step of cutting the groove using an end mill and a sub-step of rounding the bottom of the groove using a round-end mill.

7. The method according to claim 5 or claim 6, wherein the second step comprises a sub-step of shaving the side surfaces of the groove using a shaving bit for the side surface of the groove and a sub-step of shaving the bottom surface of the groove using a round bit for the bottom of the groove.

8. The method according to claim 5, claim 6 or claim 7, wherein shaving is performed in one direction in the second step.

9. The method according to claim 5, claim 6 or claim 7, wherein shaving is performed in a reciprocating manner in the second step.

10. The method according to any one of claims 4 to 9, wherein the method includes a measuring process to automatically measure the width of the processed groove during or at the completion of the process.

11. A shaving bit for the side surface of a groove, wherein replaceable blades are disposed at right and left edges of the shaving bit, wherein the blades each have a rake angle of about 20° with respect to a surface adjacent to a flank.

12. A shaving bit for the side surface of a groove, wherein replaceable blades are symmetrically disposed at right and left edges of the shaving bit, wherein the blades each have a rake angle of about 20° at a flank.

13. A round bit for the bottom of a groove wherein a replaceable throw-away-chip blade is fixed with a clamping bolt.